



## Significant Neurological Study for Lifestyle Related Diseases Worldwide From Now

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### Keywords

European Society of Cardiology (ESC), European Society of Hypertension (ESH), ESC/ESH Guidelines for Hypertension, American Diabetes Association (ADA), Action to Control Cardiovascular Risk in Diabetes (ACCORD), Orthostatic Hypotension (OH)

An overview of modern medical society shows that various diseases of metabolic syndrome are increasing in both developed and developing countries [1]. Among them, hypertension and diabetes are the most frequent diseases which require continuous treatment for years. They are lifestyle-related diseases and need the usual adequate habitual style for each person.

We can consider medical matters from the neurological point of view. A variety of nerve control and mental stress are involved in our daily lives. For example, blood pressure may increase in hypertension, and blood glucose value may increase in diabetes. In contrast, blood pressure may rapidly decrease in the diabetic patient with orthostatic hypotension (OH) due to diabetic neuropathy, when he changes his postures from lying to sitting, and from sitting to standing [2].

In other words, various factors of the nervous,

psychological, and psychiatric systems can affect hypertension and diabetes. Furthermore, they can also affect the diet from the stress, probably leading to obesity, dyslipidemia, hyperuricemia, gout, cerebrovascular accident (CVA), and coronary artery disease (CAD). Recent research shows that neural cell adhesion molecule-1 (NCAM-1) was significantly associated with an increased risk of CAD [3].

As for hypertension, remarkable progress has found in understanding the pathophysiology, epidemiology, and treatment. There is a wealth of evidence that lower control of blood pressure can substantially decrease morbidity, mortality, and other complications [4,5]. To achieve this goal, various effective and proven strategies of medication and a well-tolerated lifestyle have been necessary. However, the control of blood pressure has not been satisfactory in the world. By controlling blood pressure in an adequate range for patients with hypertension, CVA, and CAD can be preventable to some extent [6,7].

## Short Communication

Recently, the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH) have both published guidelines for hypertension in Europe [8,9]. Furthermore, practice guidelines for them were also published [10,11]. 2018 ESC/ESH guideline for the management of arterial hypertension has 89 pages and 629 references [8,9], which seems to be satisfactory quality. From the neurological aspect, it includes white-coat hypertension, the brain in hypertension, cerebrovascular disease/cognition, and cognitive dysfunction/dementia.

Regarding the therapy for hypertension, antihypertensive agents should not be given from the beginning. Before medicine, non-drug therapy has been important, which is correcting or adjusting lifestyle. In addition to hypertensive patients, many people are in the preclinical stage for hypertensive tendencies. Such subjects are recommended to prevent hypertension by adjusting lifestyle in an appropriate way [12].

There are several methods of non-drug therapy for adjusting lifestyle [8]. They include i) dietary sodium restriction [13], ii) moderation of alcohol consumption [14], iii) other dietary changes [15], iv) weight reduction [16], v) regular physical activity [17] and vi) smoking cessation [18].

As for clinical research for hypertension, authors and colleagues have reported the efficacy of adjusting the lifestyle [19]. Among thousands of hypertensive patients, the percentage of subjects who can discontinued antihypertensive agents was approximately 4.6% - 6.1% for several years. We have picked up 50 cases including 25 males and 25 females and examined the detail of them. The results were that i) family history of hypertension was positive for 66% in women, ii) smoking ratio was 76% in men, iii) alcohol consumption was 76% in men, iv) dyslipidemia was 42%, v) T2DM was 12%. It seems that 12% would be lower than the usual ratio because there is a higher prevalence of diabetes associated with hypertension.

One of the reasons would be the presence of macroangiopathy and microangiopathy from diabetic

complications. Then, the existence of the impaired function of the blood vessel in the whole body may be involved. The improvement of blood pressure control would not be easy, because of already impaired vascular function. Six diabetic cases out of 50 subjects (12%) showed a weight reduction of 2.8 kg on average due to lifestyle adjustment [19]. Consequently, diabetic improvement seemed to be also beneficial to the hypertensive situation.

Diabetic patients have been at higher risk for kidney and cardiovascular diseases. They can lower the complication with lower blood pressure maintenance by adequate treatment [20]. American Diabetes Association (ADA) had proposed the guideline for high blood pressure in its standards of medical care in diabetes [21]. For patients with both diabetes and hypertension, a more detailed response has been required and recommended methods have been reported [20].

Concerning the blood pressure control in diabetic patients, both the blood flow in the cardiovascular system and regulation by the instantaneous nervous system has been involved in the various pathophysiological condition. For diabetic neuropathy, orthostatic hypotension (OH) is widely known as one of the autonomic nervous disorders.

Let me introduce the actual diabetic case with OH, from many patients that the author treated for long years. A case is a 59-year-old man associated with severe diabetic complications including microangiopathy and macroangiopathy. In the supine position on the bed, the blood pressure is 164/96. After changing the posture to the sitting position on the bed, it dropped to 126/78 at once. Successively, just after he changed standing up, blood pressure has fallen rapidly to 98/50. Furthermore, immediately after walking 2 or 3 steps, he felt blackout and fell on the floor. This episode can be involved in arteriosclerosis, hypertension, diabetes, neuropathy, OH, impaired blood pressure control system, and so on. These multiple factors may influence each other in the aggravating cycle.

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Formerly, Action to Control Cardiovascular Risk in Diabetes (ACCORD) group studied intensive blood pressure (BP) control in type 2 diabetes mellitus (T2DM) [22]. BP changes were checked after standing for 3 times in 3 minutes in more than 4000 T2DM patients. As a result, 20% of them showed OH. The definition of OH showed that orthostatic decline in systolic BP  $\geq 20$  mm Hg or diastolic BP  $\geq 10$  mm Hg, occurred at least 1 time [23]. Consecutively, further study was conducted in 4268 subjects. As a result, the relationships of OH showed positive for dizziness, fractures, later mortality, and negative for falls or CVD events [2].

In summary, this article described the topics concerning the neural regulation for hypertension and diabetes. For the treatment of metabolic syndrome and lifestyle related diseases for long, psychological and psychiatric control would be also necessary. As a new trial, there is computer research on the Internet of things (IoT) concerning stress, diabetes, and hypertension [24]. It is expected that current content would become a useful reference and that this journal would develop providing significant rehabilitation information for body and soul in the future.

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